Journal of Development Economics 126 (2017) 154–166

Contents lists available at ScienceDirect

Journal of Development Economics

journal homepage: www.elsevier.com/locate/jdeveco

Trade and labor reallocation with heterogeneous enforcement of labor regulations[☆]

Rita K. Almeida[a], Jennifer P. Poole[b,*]

[a] The World Bank and IZA, United States
[b] American University and IZA, United States

ARTICLE INFO

JEL classification:
F16
J6
J8

Keywords:
Globalization
Enforcement
Labor market regulations

ABSTRACT

This paper revisits the question of how trade affects labor market outcomes in a developing country setting. We explore the fact that plants face varying degrees of exposure to the enforcement of labor market regulations, and rely on Brazil's currency crisis in 1999 as an exogenous source of variation in access to foreign markets. Using administrative data on employers and their employees, and on the enforcement of labor regulations at the city level over Brazil's crisis period, we document that the way a currency shock affects employment depends on the stringency of *de facto* labor market regulations. In particular, we show for Brazil, a country with strict *de jure* labor regulation, that after a depreciation, plants facing stricter enforcement of the labor law increase employment by less than plants facing looser enforcement. These findings are consistent with the hypothesis that, in the context of strict *de jure* labor market regulations, increased enforcement limits the plant-level productivity gains associated with a more global market. Therefore, increasing the flexibility of *de jure* regulations may allow for broader access to the gains from trade.

1. Introduction

A key argument in favor of liberalizing trade relations is that factors can reallocate to more efficient uses, allowing for enhanced productivity, income growth, and consumer welfare (Pavcnik, 2002; Feyrer, 2009; Broda and Weinstein, 2006). Early studies in many developing countries, however, found little impact of trade liberalization on plant-level employment and wages (Currie and Harrison, 1997; Feliciano, 2001). More recent work offers evidence of slow labor market adjustment to trade reform (Menezes-Filho and Muendler 2011). A potential explanation for these findings are restrictive labor market regulations, which inhibit the reallocation of workers, limiting the extent to which plants can adjust to shocks (Freund and Bolaky, 2008; Kaplan 2009; Hsieh and Klenow, 2009).

In this paper, we revisit the question of the impact of trade on labor adjustment in a developing country by exploring the fact that *de facto* labor regulations are heterogeneous within countries. We rely on detailed administrative data from Brazil covering the country's currency devaluation episode. Our main reduced-form specification relates exogenous industry-specific exchange rate shocks to plant-level employment over time, differentially for plants located in distinct labor market regulatory environments. Our findings show that, in response to a currency shock, more stringent *de facto* regulations relatively decrease formal employment at the plant level. We also demonstrate that strict *de jure* labor market institutions limit the possibility for plant-level productivity and profitability gains associated with global markets.

From a policy standpoint, our work offers an understanding of the mechanisms affecting plant-level employment in an increasingly globalized world. The trade-off between job security, on the one hand, and productivity and growth, on the other hand, is one of the most prominent public policy debates worldwide. The long-term gains from an open and flexible economy may be accompanied by short-term costs for workers in terms of unemployment. Our work shows that labor

☆ Our special thanks to Paulo Furtado de Castro for help with the RAIS data and to the Department of Economics and Academic Computing Services at the University of California, San Diegf4o for assistance with data access. We also thank the Brazilian Ministry of Labor for providing data on the enforcement of labor regulations and important information about the process of enforcement, especially Edgar Brandão, Sandra Brandão, and Marcelo Campos. For helpful comments and suggestions, we are grateful to workshop participants at American University, Claremont McKenna College, the Census Bureau, the Council of Economic Advisers, the Danish Institute for Government Research, the Federal Reserve Bank of San Francisco, the Federal Reserve Board of Governors, George Mason University, GREDEG-CNRS, the Inter-American Development Bank, Syracuse University, the Technological Institute of Costa Rica, UC Irvine, UC San Diego, UNCTAD, Yale University, and various conferences. Financial support from the UCSC Academic Senate Committee on Research is acknowledged. Aaron Cole and Kun Li provided excellent research assistance.
* Correspondence to: School of International Service, 4400 Massachusetts Avenue NW, Washington, D.C. 20016, United States.
E-mail address: poole@american.edu (J.P. Poole).

http://dx.doi.org/10.1016/j.jdeveco.2017.01.004
Received 24 April 2013; Received in revised form 10 August 2016; Accepted 30 January 2017
Available online 06 February 2017
0304-3878/

regulations designed to protect workers may actually further reduce employment as costs increase. Therefore, increasing the flexibility of *de jure* regulations will stimulate job creation and offer broader access to productivity gains.

We contribute to a growing body of work in several ways. First, the micro-data available for Brazil are rich and appropriate to study the effects of globalization on employment. We exploit an administrative database covering the formal-sector labor force. Second, we are not aware of any paper allowing for globalization to impact plants differently depending on their exposure to labor market regulatory enforcement. Brazil has one of the most restrictive labor market regulatory frameworks in the world (Botero et al., 2004; Almeida and Carneiro, 2012).[1] However, the size of the informal labor force suggests that enforcement is weak in some areas, hinting at a gap between the laws stated on the books (*de jure* regulations) and their effective implementation (*de facto* regulations). Therefore, contrary to previous studies which rely on cross-country or across-state variation in existing *de jure* labor regulations (e.g., Besley and Burgess, 2004; Autor et al., 2007), we explore the fact that Brazilian employers are exposed to varying degrees of *de facto* labor regulations, via differences in the intensity of labor inspections. Especially in a developing country context where enforcement is not homogeneous, we argue exploring time series and within-country variation in regulatory enforcement offers a better measure of a plant's true flexibility in adjusting labor to shocks than looking at variations in *de jure* regulations.[2] We thus investigate the differential impact of globalization on formal employment among otherwise identical plants facing different *de facto* enforcement of the labor law.[3] Ponticelli and Alencar (2016) explore similar within-country variation in the degree of enforcement of financial regulations in Brazil.

Finally, in contrast to most of the literature investigating the impact of trade on the real economy using potentially endogenous tariff changes,[4] we explore the Brazilian currency's strong devaluation in January 1999 as a large and unanticipated exogenous shock to both employers and workers.[5] Following Goldberg (2004), we construct trade-weighted industry-specific real exchange rates in order to capture changes in industry competitiveness over time. The economy-wide real exchange rate depreciated 32 percent from 1996 to 2001, with a 23 percent drop occurring between December 1998 and January 1999 alone (see Fig. 2.1; Muendler (2003)). However, though all industries suffered exchange rate declines over this time period, some endured more severe shocks than others, as measured by trade-weighted real exchange rates. We rely on this industry-level variation in real exchange rates over time to exogenously identify the effect of Brazil's globalization on formal employment.

Our main analysis is at the plant level, investigating the differential impact of a currency shock on formal employment for plants located in heavily-inspected cities relative to otherwise identical plants located in weakly-inspected cities. Our main results are consistent with the view that the extent to which trade affects labor market outcomes depends on the *de facto* stringency of the labor regulations faced by plants. In particular, in response to a currency depreciation, plants facing stricter enforcement of the labor laws increase employment by less than plants facing fewer inspections. Our results strongly suggest that more stringent *de jure* regulations limit job creation. Moreover, we show that this increased enforcement of labor regulations is also associated with lower plant-level productivity, as proxied by plant-level average wages.[6]

Our paper also relates to a number of different literatures. First, our research is closely linked to a growing body of structural models linking trade and labor market policies, such as firing costs. In the model presented by Coşar et al. (2016), tariff liberalizations increase firm-level job turnover, and reductions in firing costs reinforce the impact of globalization further increasing job turnover. Kambourov (2009) presents a model in which liberalizing trade in a restricted labor market environment is associated with slower inter-sectoral labor market reallocation, lower output, and reduced productivity. Fajgelbaum (2013) notes that labor market frictions, which increase the costs of hiring workers, reduce firm growth and productivity, inducing a negative relationship between labor market rigidities and openness across countries. We see these structural papers as complementary to our reduced-form framework designed to identify the causal implications of a real exchange rate depreciation on formal labor employment in the presence of a complete set of labor market regulations.

Second, our research is related to a set of empirical papers on product market liberalizations in different labor market environments. Aghion et al. (2008) show that India's deregulation of the *License Raj* (control over entry and production in the manufacturing industry) led to differential rates of growth across industries located in states with pro-employer labor market institutions relative to industries located in states with pro-worker labor institutions. Hasan et al. (2007) also distinguish India's states by the extent of labor market restrictions, and analyze the impact of India's 1991 trade reform on labor demand. The authors find supportive evidence for the interaction of trade reform and labor regulations; that is, the impact of trade reform on labor demand is larger in states with more flexible labor institutions. Using the same data, Topalova (2010) demonstrates that India's trade liberalization negatively impacted poverty and per capita consumption predominantly in states with less flexible labor markets. Also relevant to our study is Freund and Bolaky (2008) who argue that trade can only improve living standards in flexible economies. In particular, their findings on hiring and firing costs suggest that the positive effects of openness are reduced when labor regulations are excessive. Similarly, Eslava et al. (2010) consider the case of Colombia's pro-market reforms of the 1990s. The authors find that allowing for frictionless factor adjustment would lead to substantial improvements in efficiency over the reform period. Our data allows us to move beyond the industry level and state level, in order to study plant-level employment changes. Moreover, as we previously mention, exploiting variation in *de facto* labor regulations offers a more complete measure of labor market flexibility than variation in *de jure* labor regulations alone.

The paper proceeds as follows. In the next section, we provide

[1] There is an extensive literature for developing countries analyzing the relationship between labor market regulations and labor market outcomes (e.g., Kugler (1999), Kugler and Kugler (2009), Ahsan and Pages (2009), Petrin and Sivadasan (2013), and several other studies cited in Heckman and Pages (2004)).

[2] Bertola et al. (2000) suggest that differences in enforcement across countries, related for example to the efficiency of a country's legal system, are as or even more important, than differences in *de jure* regulations. For example, Caballero et al. (2013) explore a panel of 60 countries around the world and find that labor regulations have adverse effects on job turnover and plants' speed of adjustment to shocks, but only in countries with a strong rule of law and government efficiency (taken as measures of enforcement of regulations). However, as with many cross-country studies, the limited time-series variation in labor regulations and measures of enforcement pose challenges for identification.

[3] Currie and Harrison (1997) rule out labor market regulations as an explanation for their insignificant finding of the effects of trade reform on employment levels, and suggest that despite formal labor market barriers there is little enforcement which leaves regulations ineffective. Unlike Currie and Harrison (1997), our city-level data on Ministry of Labor inspections allow us to capture exactly this variation in within-country compliance with labor market regulations.

[4] Political economy factors in tariff formation and adjustment have been noted by a number of authors; see, for example, Olarreaga and Soloaga (1998) for the case of Brazil's regional free trade area, Mercosur.

[5] Other papers that explore currency shocks as sources of exogenous variation to investigate international trade relationships include Verhoogen (2008), who uses Mexico's 1994 peso devaluation to explore the relationship between trade and inequality, and Brambilla et al. (2012), who use Brazil's currency crisis as a shock to Argentinean exporters.

[6] Ponticelli and Alencar (2016) also report similar evidence with respect to court enforcement in Brazil. Firms located in municipalities with less congested courts experience larger increases in investment and output.